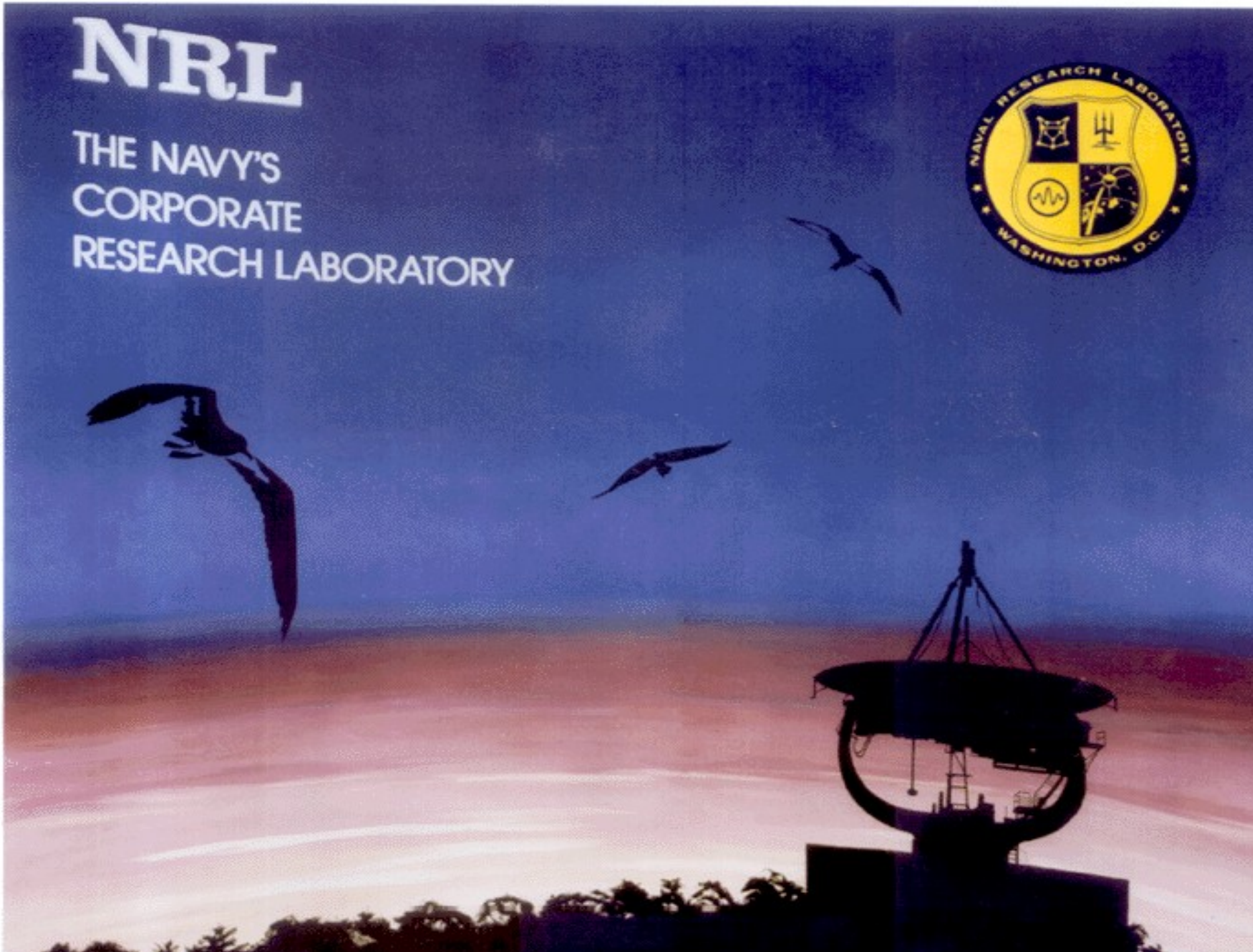
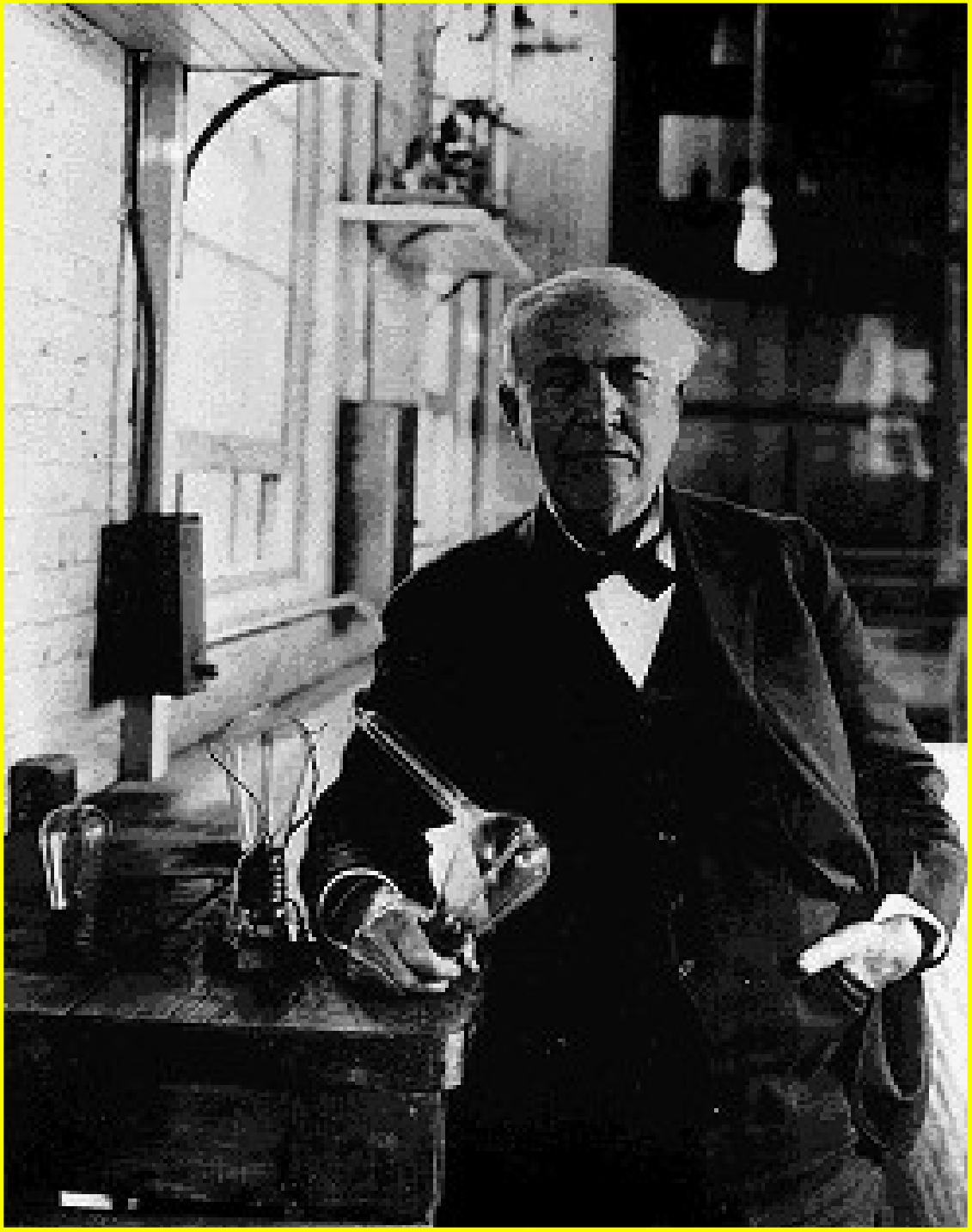

NRL
THE NAVY'S
CORPORATE
RESEARCH LABORATORY
NAVAL RESEARCH LABORATORY
WASHINGTON, D.C.

EDISON



NRL MISSION

TO CONDUCT A
BROADLY BASED MULTIDISCIPLINARY PROGRAM OF SCIENTIFIC RESEARCH AND ADVANCED TECHNOLOGICAL DEVELOPMENT

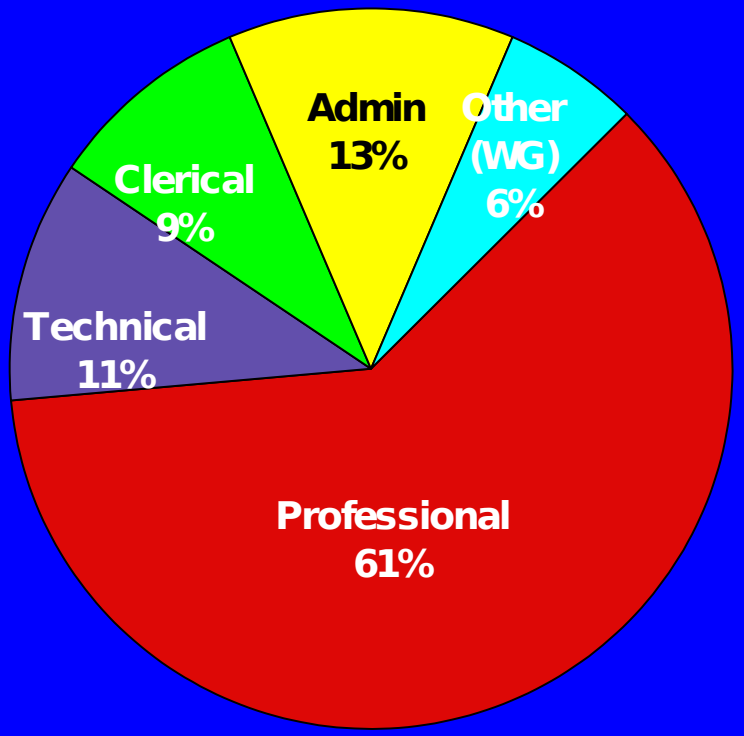
DIRECTED TOWARD MARITIME APPLICATIONS
OF NEW AND IMPROVED MATERIALS, TECHNIQUES, EQUIPMENT, SYSTEMS AND OCEAN, ATMOSPHERIC AND SPACE SCIENCES, AND RELATED TECHNOLOGIES.

The Navy and Marine Corps Corporate Laboratory

NRL RESEARCH TEAM

TOTAL Personnel 2787

- BACHELOR 556
- MASTER 407
- DOCTORATE 844

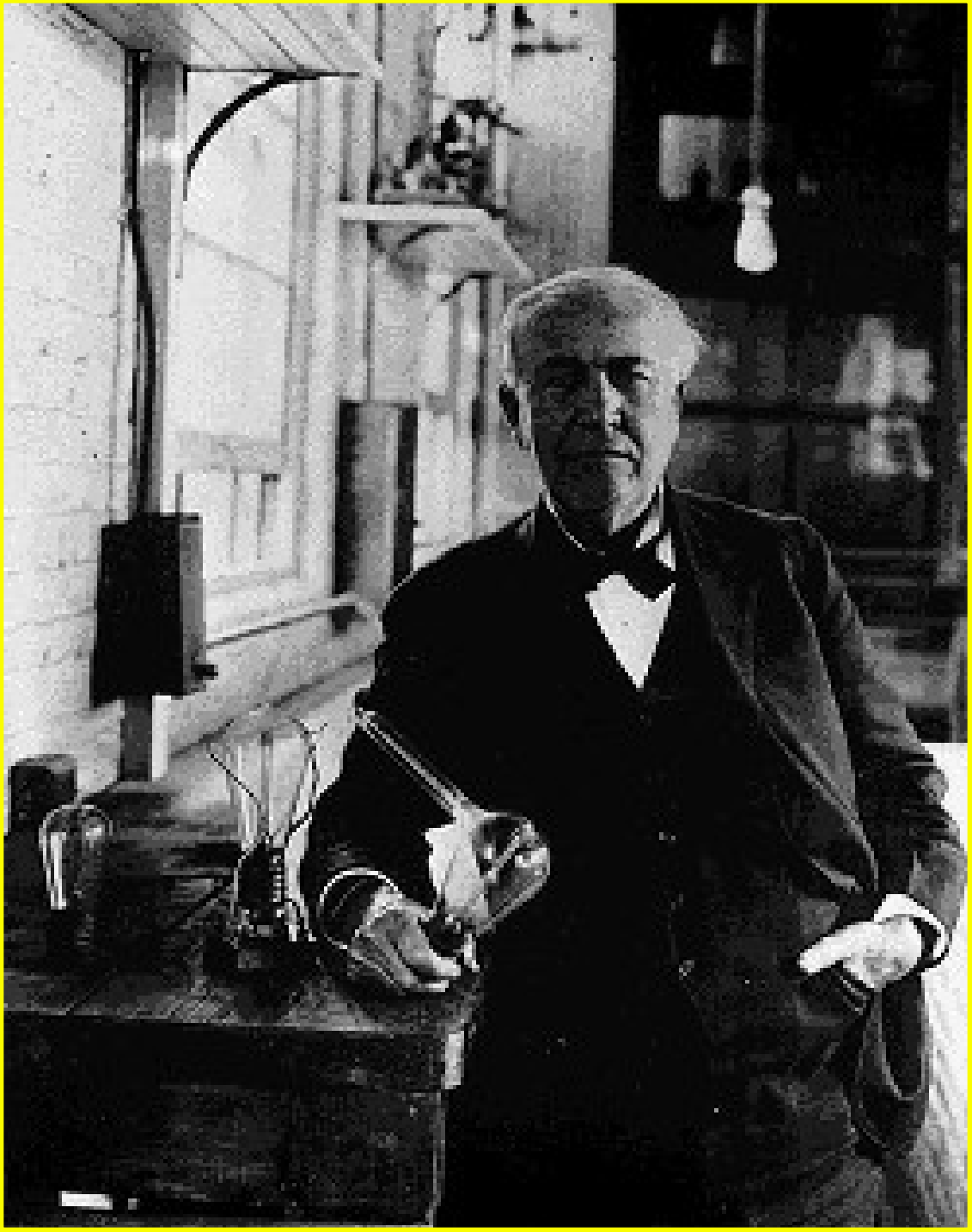


SCIENTISTS/ENGINEERS: 1625

- PHYSICISTS 472
- ELECTRONICS ENGINEERS 427
- OTHER 246
- CHEMISTS 108
- COMPUTER SCIENTISTS 102
- MECHANICAL ENGINEERS 61
- ASTRONOMERS 50
- AEROSPACE ENGINEERS 57
- GEN PHYS SCIENTISTS 47
- MATHEMATICIANS 39
- METALLURGISTS 16

The Navy and Marine Corps Corporate Laboratory

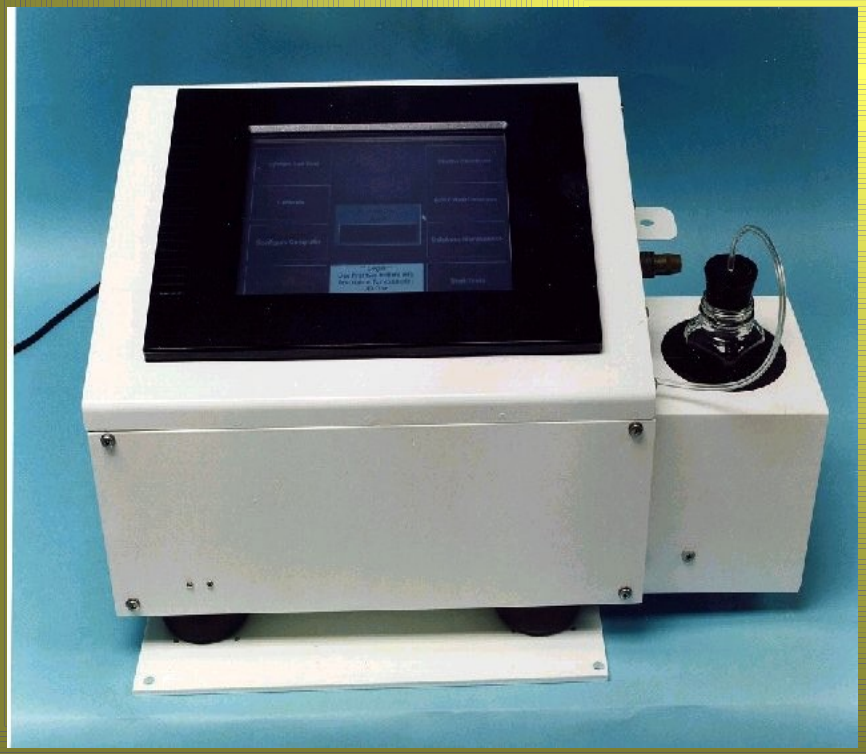
EDISON



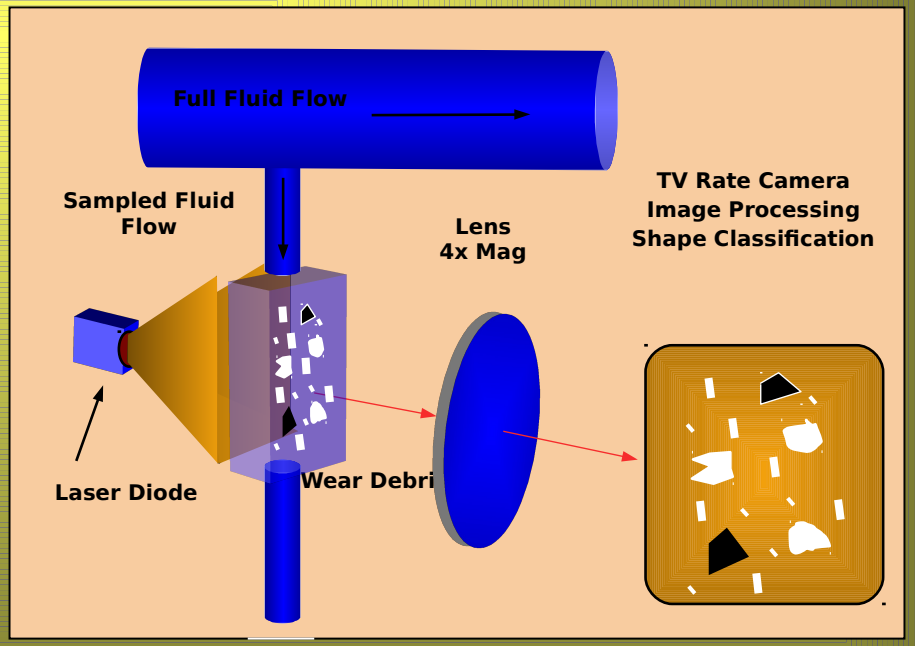
LaserNet FINES
OPTICAL OIL DEBRIS MONITOR
CONDITION BASED MAINTENANCE

Safety Affordability Reliability

LaserNet Fines INSTRUMENT



LaserNet Fines SCHEMATIC



HYDRAULIC SYSTEM FLUID ANALYSIS CAPABILITIES

- **ABSOLUTE ACCURACY TRACEABLE TO NIST SRM 2806**
- **NO CALIBRATION REQUIRED**
  ACCURACY FIXED BY CAMERA PIXEL SIZE
- **QUANTIFIES WATER CONCENTRATION**
- **IDENTIFIES ABRASIVE OXIDES AND FIBERS**
- **CLASSIFIES WEAR PARTICLES - <u>FINDS MACHINE FAULTS</u>**
- **VERIFIES EFFECTIVENESS OF MAINTENANCE ACTIONS -**
  - **CHECKS PERFORMANCE OF FILTERS AND CLARIFIERS**

LaserNet FINES DEVELOPMENT TIME LINE

1991 ONR/NAVSEA funds for Air Vehicle diagnostic System ATD

1994 First LaserNet fines patent application

1995 NRL demo of first prototype

Formation of Integrated Product Team (Govt participants)

1996 Funding by ONR under Accelerated Capability Initiative (ACI) on Condition Based Maintenance

Lockheed Martin selected as commercial IPT member

Contract to build instrument signed in November

1998 First unit shipped in April

1999 Lockheed Martin signed patent license for commercialization

2000 LNF-M unit introduced for military application

Agreement with LM and Spectro, for commercial distribution

2001 LNF-C instrument for commercial application on market

FLC award recognizes NRL team for technology transition

Approved for Public Release; Distribution Unlimited
Unclassified

Integrated Product Development Process for the Accelerated Transition from the Laboratory to a Commercial Instrument

INTEGRATED PRODUCT DEVELOPMENT TEAM

LOCKHEED MARTIN

PREDICT/LI
INNOVATIVE PREDICTIVE MAINTENANCE

NAVSEA
NAVAL SEA SYSTEMS COMMAND

CURRENT LaserNet FINES DEVELOPMENT TEAM

- **NRL Technology Invention And Development**
- **LOCKHEED MARTIN**
  - **Design And Development Of Commercial Instruments - First And Second Generation**
  - **Commercial License**
- **SPECTRO INC**
  - **Commercial Market Development And Instrument Distribution**

NRL OFFICE OF TECHNOLOGY TRANSFER

Working with Industry to commercialize *NRL Technology*

Contact:

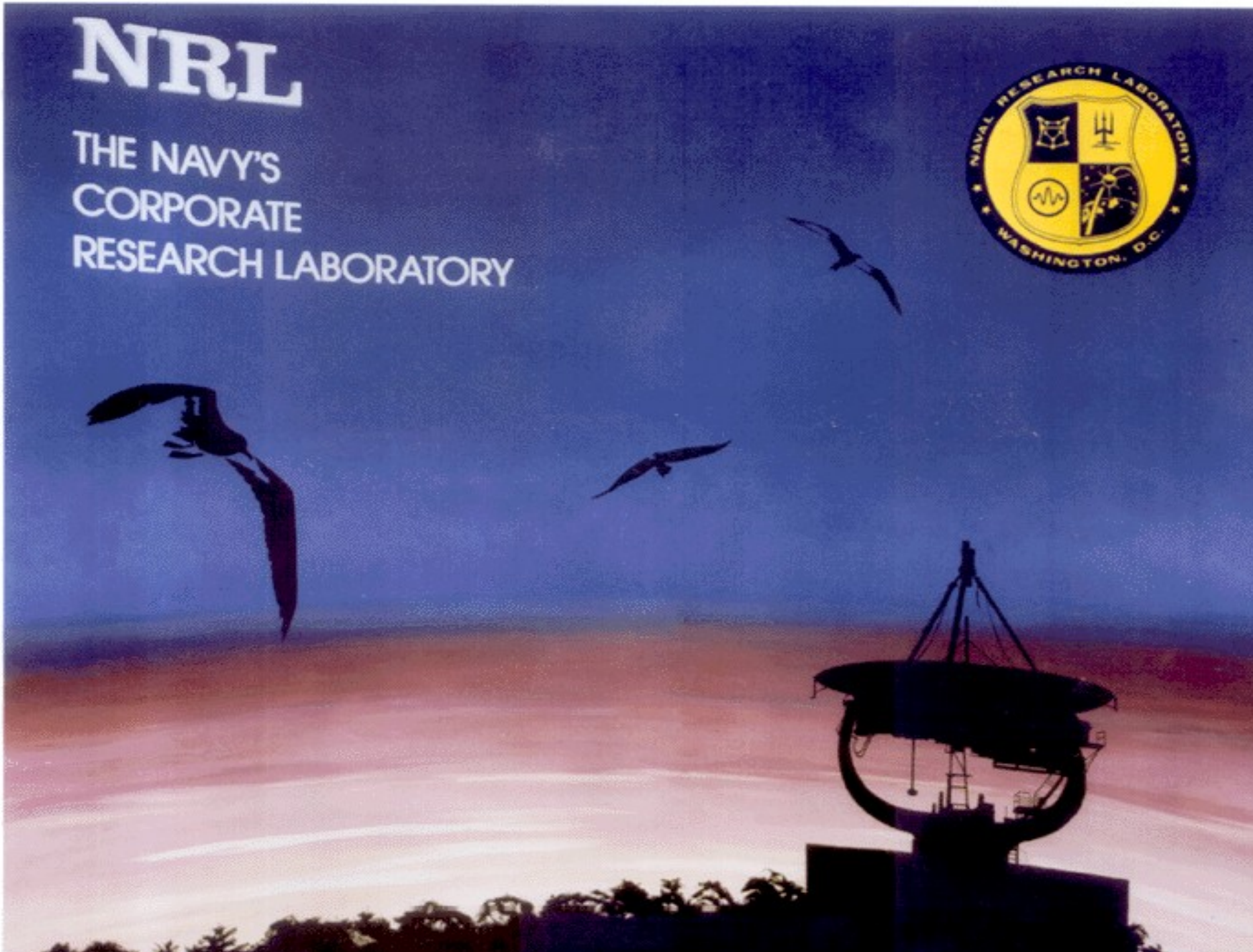
Catherine Cotell
202-404-8411
COTELL@NRL.NAVY.M

Celia Merzbacher
202-767-3083
MERZBACHER@NRL.NAVY.MIL

ome NRL Licensees:

Schlumberger
BACHARACH The Measurable Difference
CALMAR OPTCOM
CiDRA The Difference is Agility
Digital Instruments
IMRA
AVON ENGINEERING
Rhodia Electronics & Catalysis
FIBERTEK, INC.
LOCKHEED MARTIN
KN Aerospace Services
eikos INC. Product Development Specialists
Environics®
21 CENTURY COATINGS High Performance Coatings
BLUE ROAD RESEARCH
LifePoint, Inc.

NAVAL RESEARCH LABORATORY
WASHINGTON, DC


NRL
THE NAVY'S
CORPORATE
RESEARCH LABORATORY
NAVAL RESEARCH LABORATORY
WASHINGTON, D.C.

Some NRL Licensees

Environics®

LOCKHEED MARTIN

GKN Aerospace Services

KEY OPTICAL SYSTEMS Keopsys

CALMAR OPTCOM

LifePoint Inc.

BACHARACH The Measurable Difference

Rhodia Electronics & Catalysis

CiDRA The Difference is Agility

NOVA ENGINEERING

21st CENTURY COATINGS High Performance Coatings

BLUE ROAD RESEARCH

Schlumberger

Lake Shore Cryotronics, Inc.

eikos INC. Product Development Specialists

Quantum Magnetics Advanced Magnetic Systems An InVision Technologies Company

IMRA

FIBERTEK, INC.

The Navy and Marine Corps Corporate Laboratory